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Interactive comment on "Socio-hydrological spaces in the Jamuna River floodplain in Bangladesh" *by* Md Ruknul Ferdous et al.

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Replies to editor comment

We want to thank the editor for encouraging us to reply to the reviewers' comments. To a large extent, they are sympathetic to our proposal, but they also concur in stating that our proposed 'new approach' of using the concept of 'socio-hydrological spaces' to do socio-hydrology research is not yet well enough defined, its empirical use at other sites it not yet explained well enough, and the exact purpose of using socio-hydrological spaces is not yet argued well enough. We are grateful for these comments, because they help us to advance our own reflection about these issues. Our 'intellectual intuition' tells us that socio-hydrological spaces are a useful addition to the methods used in

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socio-hydrology. This assessment is based on the one hand on our use of the concept to understand the socio-hydrology of the Jamuna flood plain. On the other hand, our proposition is based in our extensive exposure to different kinds of research, spanning the full range from deterministic modelling to narrative case studies, and our wish to bridge the (inter)disciplinary 'gaps' that result from these different approaches. We agreed that we need to 'sell' our proposition better, and the reviewers gave given us clues as to how we can do this.

Our overall argument runs as follows (which is repeated in our replies to individual reviewers). We think SHS provides a methodological (and possibly paradigmatic) bridge between two contrasting approaches to studying human-water interactions: hydrosocial research based in sociology and human geography, and socio-hydrology based in hydrology and physical geography. These are described and discussed in Wesselink, A., Kooy, M. and Warner, J. (2017) "Socio-hydrology and hydrosocial analysisâĂŤ: toward dialogues across disciplines", WIREs Water 4(2) 1–14. Hydrosocial research take the messiness of the socionatural world as a given and results in location-specific narrative case study analyses with limited or no attempt at generalisation. Socio-hydrology looks to generalise findings from case studies through a system-approach using conceptual and mathematical models. "Socio-hydrological system" is thereby an abstract entity detached from the reality on the ground.

We propose "socio-hydrological space" as a tool that helps to make the necessary intermediary step between the messy reality of the specific location (space) and the abstract system of conceptual and mathematical models. The primary function of SHS is as a lens through which to view the complex reality of specific cases in order to find patterns in human-river interactions, which can then be compared to patterns in other locations to see if further generalisation towards universal models is possible. Its use invites the researcher to have an open mind to the existence of expected or unexpected patterns in location-specific data using a thorough understanding of the location: society, economics, natural system, technical interventions, etc. Subsequently,

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other cases may be analysed in order to explore whether the same or different patterns occur. These patterns can then be generalised through the more formal conceptualisation of socio-hydrological systems. On the one hand SHS thereby relates to a specific space, on the other hand it helps to find general patterns of human-river interactions: it serves as a methodological intermediary step or bridge between hydrosocial research and socio-hydrology.

To use the concept of SHS empirically, we propose a two-step approach. First, a thorough understanding of a specific floodplain system (geography, history, technology, societal occupation etc.) results in a preliminary classification of the study area into distinct SHS. Second, the classification is tested for statistical significance using available or newly collected data. If the classification is not statistically significant, merging or splitting of categories should be considered where different social dynamics may be the reason for splitting (repeat step 1). The concept suggests that the interactions between society and water are place bound because of differences in social processes and river dynamics, but also generalisable since similar SHS patterns may be found elsewhere. Rather than a generalized model for understanding how such interactions occur, the concept draws analytical attention to how flood dynamics co-evolve with societal dynamics. Such attention is useful anywhere in the world and for other socio-hydrological systems than floodplains.

We believe we can revise the paper using the above line of argument to more convincingly show that socio-hydrological spaces is a useful tool in socio-hydrology. We will also make sure to pay attention to the detailed comments and suggestions made by the reviewers.

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